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FOR ARMS REDUCTION

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ACTIVE DEFENSE: A CONTROLLED CONTEXT FOR ARMS REDUCTION*

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Despite the appearance of progress in controlling nuclear weapons provided by treaties limiting strategic arms (SALT I), and anti-ballistic missiles (ABM treaty), arms-control efforts over the past twenty years have not succeeded in preventing continued expansion of arsenals of offensive arms to excessive levels. The strongest evidence of public awareness and frustration with this failure is its ready acceptance of the concept of a nuclear freeze and its support of freeze resolutions throughout the country. At the same time, the breakdown of bilateral arms-control talks has produced a sense of growing political paralysis.

Now, as the United States and the Soviet Union resume their dialog concerning the reduction of strategic arms, considerable public attention has focused on the Reagan Administration's most controversial approach at redressing the failure of previous arms-control efforts to curb the accumulation of nuclear arms by the superpowers. Calling into question the strategic doctrine that has dominated U.S. foreign policy for the past two decades, the President has advocated a quest for means of active defense to counter the threat of nuclear annihilation. The relationship between arms control and this approach, now institutionalized in the Strategic Defense Initiative (SDI)

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and nicknamed "Star Wars," is the subject of extensive political debate. It has also been the focus of a growing Soviet propaganda campaign surrounding the resumption of arms control talks.

When one considers the magnitude of longstanding Soviet programs to develop and deploy extensive defensive weapon systems, the near-panicked tone of Soviet denunciations of the SDI seems reason enough not to abandon vigorous research into defensive weapon technologies. Support of such research aimed at preventing technological surprise or the appearance of idleness in the face of Soviet programs is not a blanket endorsement of the Administration's initiative. Pursued uncritically, the SDI could stimulate another destabilizing arms race. Nonetheless, the concept of active strategic defense should not be dismissed summarily. If accompanied by the creation of an appropriate arms-control context, it could, in fact, prove a catalyst for deep arms reductions .

As articulated by the Administration, the hope of the Reagan proposal is to shift from assured destruction to assured survival by identifying the means of defending our cities against nuclear attack by intercontinental ballistic missiles. The emphasis of the twenty-year research program envisioned by the SDI is the most difficult technical problem imaginable. The more tractable mission of developing a defense for increasing the survivability of our strategic deterrent forces--the agents of assured destruction--is regrettably neglected in the present scope of the SDI. Enhancing the survivability of the deterrent forces is critical to any movement toward deep reductions in the number of offensive missiles, as it discourages preemptive attacks during times of crisis. Eventually, ensuring the survivability of our nuclear deterrent--however small it becomes--must become the keystone of credible strategy of active strategic defense.

Presently, the SDI contains no commitment to deployment of any defensive weapons, although several types are being investigated. The technological approaches to active defense range from directed-energy (beam) weapons--powerful lasers and particle beam accelerators that can hurl bolts of subatomic bullets at the speed of light across thousands of miles of space--to more conventional technologies such as miniature chemical rockets carried in large canisters orbiting the Earth. Each approach has its technical merits, each its drawbacks. All share the limitation that if the offense is unconstrained and unlimited, the defense faces impractical odds and unacceptable expense. Moreover, none of these technologies is ready for deployment today. Yet the claim by the critics of Star Wars that active defense is an impossible and dangerous illusion is as mistaken as the Administration's claim that the SDI is useful regardless of the arms-control context. Weapons--either defensive or offensive--are not the end of policy; they are the tools of policy to be used either wisely or foolishly. Their possession can be either compelling or irrelevant. The objective of the SDI should be to create an amalgam of arms reduction and technology in which assured survival is both feasible and viable.

Discovery of the amalgam will require abandoning old prejudices concerning strategic policy. Critics of active defense have correctly argued that an attempt by only one of the superpowers to rapidly deploy a network of defensive weapons, which could effectively embargo the use of space, can be highly destabilizing in a crisis. Besides actually decreasing security, such an act would likely accelerate expenditures for offensive arms in both the United States and the Soviet Union. It does not follow, however, that defensive weapons are anathema to a stable international regime. Given the realities of

the protracted, piecemeal installation of defensive weapon systems by both countries, crisis-destabilizing scenarios are unlikely. Although active defense is neither a necessary nor sufficient condition for realizing deep reductions in the number of strategic offensive weapons, it can facilitate the arms reduction process by minimizing the necessity for ironclad verifiability of arms-reduction agreements. Conversely, reduction of the number of offensive weapons and their limitation to single-warhead launchers can make strategic defense both feasible and practical. Creating a context for a steady transition from the present offense-dominated regime of assured destruction to a defense-dominated world of reduced nuclear arsenals will require a reasoned progression of small steps to ensure crisis stability at all stages of the transition.

Each step in the transitional regime must conform adequately to several norms. It should advance toward the ultimate goal of assured survival by the virtual elimination of massive nuclear stockpiles. The risks associated with inadequacies in verification must be acceptable; these risks will increase as the number of ICBMs diminish and as fixed-base ICBMs are replaced by small mobile missiles. The legitimate role of space research must be recognized, especially as it pertains to ensuring the survivability of vital space assets such as national technical means. Consequently, arms-reduction agreements in the transitional regime should curb the development and deployment of both offensive and defensive weapons. Operational constraints of co-existing offensive and defensive systems must be mutually consistent. Finally, the step-by-step approach must take account of the implications of the evolving strategic balance on the Western alliance.

In seeking agreements both to limit the militarization of space and to reduce sharply the number of offensive nuclear weapons, we would be wise to begin with small but meaningful steps. Trying to address the most severe technical and political issues first is likely to produce long periods of deadlock with attendant increases in frustration. A progression of agreements with limited objectives can build sufficient trust to enable us to resolve issues at the very heart of each country's strategic vision. The difficulty is to identify a meaningful first step; once national leaders learn to be unembarrassed by apparently small steps, progress can commence along a path that underscores the profound linkage between offensive arms, defensive arms, and the geopolitical context.

The influence of context in the controlled development of active defense can be seen from the exercise of formulating a first step in the the transitional regime. The smallest significant arms-control advance is an agreement in which each side trades away a desirable capability that it does not yet have, and for which verification issues are minimal. The Soviet Union has historically been interested in agreements that limit technological development. Examples include Soviet proposals to limit the development of maneuvering reentry vehicles, to ban anti-satellite weapons, and the ABM Treaty. The United States has historically resisted such agreements, although the ABM Treaty is a significant exception. The American political process--the debate surrounding Senate ratification of treaties--is typically preoccupied with verification, whether or not the undetectable level of cheating is significant. A first step must therefore respect the intensity of concern about verification with regard both to offensive weapons and to the emerging defensive constellations.

An example of the intertwined relationship between arms-control context and the state of development of active defense begins with a recognition of a characteristic of all deployed ICBMs with MIRVs. Defensive weapons have their greatest leverage against ICBMs during the boost phase--presently, the first five minutes of flight. As long as offensive missiles have a lengthy boost phase, many types of defensive weapons may be efficacious. The plume of incandescent gas from the booster is easily detectable, the rocket engines of the booster are vulnerable, and natural shielding provided by the atmosphere is absent during most of the boost phase. As each booster can subsequently release several reentry vehicles, destruction of the booster has high leverage for the defense. Consequently, the chief countermeasure is to eliminate boost-phase vulnerability by using fast-burn launch vehicles to reduce the boost phase to one minute or less.

Neither the United States nor the Soviet Union currently possesses fast-burn ICBM boosters, although both countries have a strong base of fast-burn rocket-engine technology developed for ballistic missile defense. Despite the existence of a considerable technology base, such as the U.S.'s Sprint missile, the development and initial deployment of fast-boost ICBMs will require several years and tens of flight tests to intercontinental ranges, especially if the boosters are to carry MIRVs. As such tests can be easily observed by national technical means, the risk of a technological "breakout" is extremely small.

Both the United States and Soviet Union have legitimate interests in developing space science and technology for national security purposes. Space is not only the medium for the rapid delivery of massive destruction; it is

also the stalking ground for what are euphemistically called national technical means, the most sophisticated espionage networks in history. As the survivability of these networks is essential to national security, both superpowers will want to understand enough about intentional disturbances of the satellite environment to ensure adequate survivability of space assets. Although these developments in space science and technology will require limited experiments in space, neither the United States or Soviet Union will have the capability for significant defense against present ICBMs for many years. Near-earth orbit tests of large space systems capable of threatening space assets should be readily detectable by national technical means.

Combining the several considerations described above, one arrives at a plausible first agreement in the transitional regime. PROPOSAL: the United States and Soviet Union should immediately agree to forgo, for ten years, the development, testing, and deployment of fast-burn boosters with ranges greater than 1000 nmi. In conjunction with this prohibition, both parties should renounce the testing or deployment in space of interceptors, kinetic or directed energy weapons, for seven years. Research on the scientific and engineering basis of defensive weapons, which may include nonthreatening space experiments, should be encouraged in parallel in both countries. Both parties should begin the exchange of scientific information related to defensive weapons with the potential for boost-phase intercept of ICBMs. As a gesture of good faith, the United States should begin the process of information exchange on a unilateral basis for a specified period.

This proposal emphasizes the profound linkage between the practicality of active strategic defense and the arms-control context in which the desirability of strategic defense is assessed. By allowing the continuation of the basic research required to support active defense, such an agreement would permit both parties to determine what measures and countermeasures are physically possible. No approaches would be foreclosed a priori.

By postponing field tests essential in the development cycle, this proposal seeks both to allay the suspicions that could foment increased expenditures for offensive arms and to create a significant period of time for explication of the political contexts in which active defense is desirable. During this period, the ABM Treaty should remain in force. An approach of making haste slowly would also provide time for the United States to reassure its allies that active defense is not a retreat into fortress America; indeed, active defense may be extendable to the far more difficult task of defending Europe against missiles such as the SS-20.

The process of exchanging scientific and technical information should be formalized. Regular meetings of senior scientific and engineering personnel from both countries, conducted under official auspices, will allow each country to assess the usefulness of the wide range of relevant technical information to be exchanged. The difficulty of establishing guidelines for the technical exchanges is not to be underestimated in the present political climate. Certainly some technology control for strategic defense will prove directly relevant to the development of countermeasures or to offensive or

tactical weapons. Hence, the exchange will not be risk-free for either party. Among the benefits of a formalized exchange of information are the continuing opportunities for confidence building throughout the transitional period. American science and technology have advanced most rapidly in an open environment. Indeed, many have argued, along with Edward Teller, that only in exceptional circumstances does the risk to national security actually outweigh the benefits of inquiry unrestricted by secrecy. Moreover, when one distinguishes between the passive knowledge received in an interchange and the active knowledge and art required for scientific inquiry and engineering execution, the benefits of exchange usually exceed the risks of revealing secrets. The judgment is one of prudence, not doctrine.

The step-by-step process of transition to a defense-dominated world will succumb to inaction unless both parties keep in view the ultimate goal of assured survival through the virtual elimination of nuclear weapons. The initial period of force for the proposed treaty limiting defensive weapons is the opportunity for an interleaving agreement to reduce the level of offensive forces. The focus of that agreement should be that insidious offspring of assured destruction, ballistic missiles carrying MIRVs. Originally introduced as a countermeasure to future ABM interceptors, MIRVed ICBMs themselves become primary targets. With the extremely high-precision delivery systems now available to both the United States and the Soviet Union, ICBMs even in ultra-hard silos can be attacked and destroyed. Observing the weapons revolution overtaking land-based ICBMs, Brezhnev argued that "The advent of increasingly numerous and accurate systems is making it possible for planners of a strategic attack to envisage a first strike that leaves the opponent

strategically crippled, capable of only a spasmodic, disorganized and strategically aimless attack--or none at all." Moreover, this attack could be carried with only a small fraction of the attacker's ICBM force. In the absence of a machine-like launch-on-warning policy, such an attack has a moderate probability of decapitating the command structure of an opponent that reduces that probability of a massive counterstrike posited by the doctrine of assured destruction. MIRVs have become the locus of an ever-increasing crisis instability.

During the period the treaty is in force, further arms-control agreements should seek to move both parties toward replacing present MIRVed launchers with reduced forces of small, single-warhead launchers. The impact of moving to such launchers is manifold. Vulnerability of ICBM forces will be reduced, thereby enhancing crisis stability. Even if the mobile missiles are extremely accurate, the exchange ratio for launchers in a first strike will be significantly smaller than for MIRVed launchers. Again the result is to enhance crisis stability. The effectiveness of a potential defensive system will be increased. Thus, if an active defense is deployed under these constraints, the probability of a successful first strike will be diminished, thereby increasing crisis stability. Finally, replacing MIRVed launchers with small, mobile launchers carrying a single warhead initiates the process of reducing the total number of strategic warheads. This build-down is an important component in reducing force vulnerability to a first strike during the period in which the possibility of defense is evaluated.

An apparent drawback of this type of build-down is that small, mobile missiles will make the reliable verification of force levels more difficult. The role of the first stages of the deployment of active defense is to make this uncertainty operationally insignificant. An alternative way of reducing the destabilizing influence of ICBM vulnerability has been proposed by Weinberg and Barkenhause. In their "defense-protected build-down," ground-based interceptors replace ICBMs according to a formula based on interceptor effectiveness. In either variant of build-down (or a combination of the two), the possibility of defense makes the reduction of offensive forces practical. Conversely, the reduced level of offense increases the practicality of active defense.

If active defense is shown to be both practical and desirable in the political (arms-control) context of the late 1990s, parallel deployment of modest defensive weapons should be encouraged with a ban on fast-boost launchers still in place. The greater the investment of both parties in emplaced defensive technology, the less attractive will be the prospect of abandoning active defense for a spiraling round of building fast-burn, MIRVed ICBMs. Eventually, the only "safe place" for offensive missiles will be hidden, together with their mobile launch platforms. The combined political-technological process can lead to a stable configuration of modest defenses and to vastly reduced offensive missiles with single warheads. These ICBMs will be relatively invulnerable to attack--if they are not launched.

As the number of ICBMs is reduced, the program of transition to a defense-dominated world must address the gross asymmetry in the configuration of United States and Soviet strategic forces. Submarine-launched ballistic missiles (SLBMs), bombers, and cruise missiles must be enmeshed in the context of active defense. As information processing and sensor technologies advance, we must prepare for the oceans to become transparent, reducing crisis stability by revealing extremely vulnerable submarines. The enhanced detection capabilities will initially drive submarines farther into the deep oceans. However, the difficulty of defending against SLBMs will decrease as submarines are pushed away from national waters. The same complex of technologies can also reveal the vulnerable "air-breathing" threat--cruise missiles and bombers.

It would be foolish to expect the transitional regime to be brief or to expect SDI to deliver fully crafted blueprints for reciprocal nuclear disarmament. Escape from the status quo will require a balance of resolve, accommodation, and technological progress to create a context in which arms control and active defense are mutually reinforcing. Toward this end, the program of active defense being developed under the SDI must nurture appropriate political contexts. Policy analysis cannot be relegated to token efforts conducted alongside technological races pursued with abandon. Premature, yet threatening, demonstrations can undermine the creation of context and at the same time divert national resources from sound research programs conducted at a reasoned pace. Conducted with prudence and patience, a program of active defense can replace the anxiety of Assured Destruction with the hope of a future free from the threat of nuclear annihilation.

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